

CLAIMS

What is claimed is:

5 1. In a plasma processing chamber, a method for improving etch uniformity while etching a semiconductor substrate, comprising:

 placing said semiconductor substrate into a sacrificial substrate holder, said sacrificial substrate holder being configured to present a sacrificial etch portion surrounding said semiconductor substrate to a plasma within said plasma processing
10 chamber to permit said plasma to etch a first surface of said semiconductor substrate and a first surface of said sacrificial etch portion simultaneously, said first surface of said sacrificial etch portion being formed of a material capable of being etched by said plasma;

 positioning said semiconductor substrate and said sacrificial substrate holder
15 into said plasma processing chamber;

 striking said plasma from an etchant source gas released into said plasma processing chamber; and

 simultaneously etching said first surface of said semiconductor substrate and said first surface of said sacrificial etch portion using said plasma.

20

 2. The method of claim 1 wherein said semiconductor substrate represents a wafer and wherein said sacrificial etch portion represents a ring surrounding said wafer.

25 3. The method of claim 1 wherein said sacrificial substrate holder is a concentric ring surrounding said substrate, a second surface of semiconductor substrate being in direct contact with a chuck of said plasma processing chamber.

4. The method of claim 1 wherein said etching is a metallization etch, said material comprising aluminum.

5. The method of claim 4 wherein said etchant source gas includes chlorine.

6. The method of claim 5 wherein said plasma processing chamber represents an inductively coupled plasma processing chamber.

7. The method of claim 1 wherein said semiconductor substrate represents a substrate for fabricating integrated circuits (IC's).

8. The method of claim 1 wherein said plasma processing chamber represents an inductively coupled plasma processing chamber.

9. The method of claim 1 wherein said plasma processing chamber represents a transformer coupled plasma processing chamber.

10. The method of claim 1 wherein said material is selected to form substantially volatile byproducts when etched by said plasma within said plasma processing chamber.

11. A sacrificial substrate holder for improving etch uniformity while etching a semiconductor substrate in a plasma processing chamber, comprising:

a sacrificial etch portion configured to surround said semiconductor substrate, said sacrificial etch portion including a first surface comprising a material capable of being etched by a plasma configured to etch said semiconductor substrate when said semiconductor substrate and said sacrificial substrate holder are disposed on a chuck within said plasma processing chamber,

wherein said first surface of said sacrificial etch portion is substantially parallel to a first surface of said semiconductor substrate when said semiconductor substrate and said sacrificial substrate holder are disposed on said chuck within said plasma processing chamber, thereby permitting said plasma to etch said first surface of said semiconductor substrate and said first surface of said sacrificial etch portion simultaneously.

12. The sacrificial substrate holder of claim 11 wherein said semiconductor substrate represents a wafer and wherein said sacrificial etch portion represents a ring surrounding said wafer.

13. The sacrificial substrate holder of claim 11 wherein said sacrificial substrate holder is a ring surrounding said substrate, a second surface of semiconductor substrate being in direct contact with said chuck of said plasma processing chamber.

14. The sacrificial substrate holder of claim 11 wherein said plasma is configured to etch a metallization layer of said semiconductor substrate, said material comprising aluminum.

15. The sacrificial substrate holder of claim 15 wherein said plasma processing chamber represents an inductively coupled plasma processing chamber.

16. The sacrificial substrate holder of claim 11 wherein said semiconductor substrate represents a substrate for fabricating integrated circuits (IC's).

17. The sacrificial substrate holder of claim 11 wherein said plasma processing chamber represents an inductively coupled plasma processing chamber.

18. The sacrificial substrate holder of claim 11 wherein said plasma processing chamber represents a high density plasma processing chamber.

19. The sacrificial substrate holder of claim 11 wherein said material is selected to form substantially volatile byproducts when etched by said plasma within said plasma processing chamber.

20. In a plasma processing chamber, an apparatus for improving etch uniformity while etching a semiconductor substrate, comprising:

sacrificial means surrounding said semiconductor substrate, said sacrificial means being configured to present a surface means of said sacrificial means to a plasma within said plasma processing chamber to permit said plasma to etch a first surface of said semiconductor substrate and said surface means simultaneously when said semiconductor substrate and said sacrificial means are disposed on a chuck in said plasma processing chamber, said surface means comprising a material capable of being etched by said plasma,

wherein said surface means is substantially parallel to said first surface of said semiconductor substrate when said semiconductor substrate and said sacrificial means are disposed on said chuck within said plasma processing chamber.

5 21. The apparatus of claim 20 wherein said plasma is configured to etch a metallization layer of said semiconductor substrate, said material comprising aluminum.

10 22. The apparatus of claim 21 wherein said material comprises substantially pure aluminum.

 23. The apparatus of claim 20 wherein said plasma processing chamber represents an inductively coupled plasma processing chamber.

15 24. The apparatus of claim 20 wherein said material is selected to form substantially volatile byproducts when etched by said plasma within said plasma processing chamber.

266060-58652680